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EXAMINER				
SAMS, MATTHEW C				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/563,878

Applicant(s)

MALIK ET AL.

Examiner

MATTHEW SAMS

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2009.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 33-51 is/are pending in the application.
4a) Of the above claim(s) 50 and 51 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☐ Claim(s) 33-49 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 09 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group 1 in the reply filed on 6/2/2009 is acknowledged.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. The drawings filed on 1/9/2006 are accepted.

Information Disclosure Statement

4. The information disclosure statement filed on 2/2/2006 has been accepted.
5. The information disclosure statement filed 1/9/2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 39 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "wishing" renders this claim indefinite because an inanimate object (*i.e.* the station) cannot wish. However, the station can "attempt" to associate with a specific wireless network.

8. The term "arbitrarily" in claims 39 and 40 is a relative term which renders the claims indefinite. The term "arbitrarily" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Since points (ii) and (iii) are considered "arbitrary" by the Applicant's own admission, the Examiner is giving those limitations no patentable weight in section 13. However, in section 15, the Examiner has given the limitations weight.

9. Regarding claim 46, the phrase "or the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claim 33 is rejected under 35 U.S.C. 102(e) as being anticipated by Adachi et al. (US-6,983,167 hereinafter, Adachi).

Regarding claim 33, Adachi teaches a medium access control system in a wireless network (Fig. 1), comprising:

- (i) an access point (Fig. 1 [1]) equipped with an SMDA compatible multi-beam antenna (Fig. 1 [2]) and a plurality of transceivers (Fig. 2 [12-1 through 12-3]) that can respectively be simultaneously connected to different antenna beams; (Col. 4 lines 51-60 and Fig. 1 [3-1 through 3-3]) and
- (ii) one or more stations scattered in reception space of a wireless LAN. (Fig. 1 [4-1 through 4-3])

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 34-37, 39, 40 and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi in view of Gurbuz et al. (US-7,301,924 hereinafter, Gurbuz).

Regarding claim 34, Adachi teaches the limitations of claim 33 above and further teaches (i) a periodically transmitted beacon frame (Col. 6 lines 53-54) that reports existence of a wireless network and provides a timing reference to each station on said network; (Col. 6 line 53 through Col. 7 line 7 *Examiner's Note*: the point of a beacon frame in IEEE802.11 is to be able to find and attach/associate with an access point)

(ii) a supervised access mode that is a period in which an access point effectively improves network throughput by controlling access to a wireless channel and adjusting transmission with users so that antenna characteristics are utilized and a plurality of simultaneous transmissions can be implemented on a same channel. (Col. 4 lines 42-65 communicate simultaneously with a plurality of stations on the same channel)

Adachi differs from the claimed invention by not explicitly reciting an unsupervised access mode that is a period in which an access point antenna is configured in an omni-directional pattern, and each station accesses a channel freely so as to be able to perform transmission using conventional carrier sensing technology; and signaling whereby an access point starts or terminates a supervised or unsupervised access period.

In an analogous art, Gurbuz teaches a wireless network (Fig. 1 [100]) comprising an access point (Fig. 1 [102]) equipped with a plurality of multi-beam antennas (Fig. 1 [106]) serving a plurality of stations (Fig. 1 [104]) comprising:

(i) a periodically transmitted beacon frame (Fig. 4 [Beacon]) that reports existence of a wireless network and provides a timing reference to each station on said network; (Col. 5 lines 48-53)

(ii) a supervised access mode that is a period in which an access point effectively improves network throughput by controlling access to a wireless channel and adjusting transmission with users so that antenna characteristics are utilized and a plurality of simultaneous transmissions can be implemented on a same channel; (Fig. 4 [Serving MIMO] and Col. 4 lines 20-29)

(iii) an unsupervised access mode that is a period in which an access point antenna is configured in an omni-directional pattern, and each station accesses a channel freely so as to be able to perform transmission using conventional carrier sensing technology; (Fig. 4 [Serving SISO] and Col. 4 lines 64-67) and

(iv) signaling whereby an access point starts or terminates a supervised or unsupervised access period. (Fig. 4 [Beacon and MIMO Beacon] and Col. 5 lines 48-53)

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement wireless communication system of Adachi after modifying it to incorporate the unsupervised access mode and signaling to start/terminate the access periods of Gurbuz since it is advantageous to be able to maximize the spectrum by utilizing MIMO while still supporting legacy devices that operate using SISO, thereby making the network more user friendly by supporting a wider range of devices.

Regarding claim 35, Adachi in view of Gurbuz teaches a protocol stack comprising:

(i) a medium access control layer that defines an access rule whereby a plurality of wireless stations access a common medium; (Adachi Col. 7 line 52 through Col. 8 line 8)

(ii) a physical layer that performs actual data transmission and reception on a wireless channel; (Gurbuz Col. 4 lines 1-9)

(iii) a management entity that manages and adjusts operation of said medium access control layer and said physical layer in order to improve overall wireless network throughput. (Gurbuz Col. 4 lines 20-67 "transmitter 202 transmits at twice the data rate of conventional 802.11a units", "the MAC layer packet is twice as large but divided into 2 for transmission via 2 spatial subchannels" and "single IF/RF chain")

Regarding claim 36, Adachi in view of Gurbuz teaches said medium access control layer comprises:

(i) a contention based access mechanism whereby a carrier sensing mechanism is used and stations compete for a transmission medium based on one set of rules; (Adachi Col. 15 lines 11-17 and Col. 18 lines 29-35)

(ii) a polling based channel access mechanism whereby an access point can satisfy a band request of a specific station while maintaining a service quality level specified beforehand by that station; (Gurbuz Col. 5 lines 36-47 and Col. 6 lines 11-30) and

(iii) a beam access coordinator that implements high-throughput by adjusting data transfer between antennas and an access point and utilizing a function of a multi-beam antenna using said contention based and said polling based access mechanisms. (Gurbuz Col. 4 lines 20-22, lines 55-63 and Col. 5 lines 36 through Col. 6 line 67)

Regarding claim 37, Adachi in view of Gurbuz teaches wherein said beacon frame described is broadcast by an access point, and has a function that reports existence of a WLAN and provides a timing reference to stations scattered on a network (Adachi Col. 6 lines 53-59, Gurbuz Fig. 4 [Beacon] and Col. 5 lines 48-53), and comprises:

(i) an identifier unique to said wireless network whereby each station can uniquely and explicitly identify an access point and therefore a specific network; (Adachi Fig. 5A [6] and Col. 7 line 61 through Col. 8 line 16)

(ii) wireless network function and protocol related information specially defined by implementation of an access point; (Adachi Col. 8 lines 1-8 and Gurbuz Col. 5 line 48 through Col. 6 line 10)

(iii) information describing a used frequency of a beacon broadcast by an access point on a wireless network; (Adachi Col. 7 lines 37-42 *i.e.* inherent to IEEE802.11b while 5 GHz. is inherent to IEEE802.11a and Col. 7 line 5) and

(iv) a period in which a wireless network operates in supervised access mode, and whereby a conventional station does not execute association or transmission in that superframe period, as a result of which effects on wireless network due to such transmissions/collisions are minimized. (Gurbuz Fig. 4 [Serving MIMO] and Col. 4 lines 20-29)

Regarding claim 39, Adachi in view of Gurbuz teaches wherein said station, when wishing (Examiner's Note: see section 7 above) to associate with a specific wireless network transmits an Association Request frame that comprises information elements described in the following (i), (iv), and (v), and further arbitrarily comprises

information elements described in (ii) and (iii) (Examiner's Note: see section 8 above) according to a network configuration and station function, and reduces signaling overhead:

(i) a wireless network identifier (Adachi Fig. 5A [BSSID]) received in a beacon frame (Adachi Col. 8 lines 1-3 and 14-16) for notifying an access point that a station wishes to associate with a WLAN; (Adachi Col. 8 lines 1-3 and 14-16 and Fig. 7 [S108])

(ii) and (iii) See section 8 above;

(iv) an address of a station itself enabling unique identification by an access point in a next communication; (Adachi Col. 8 lines 14-16 and Fig. 5A [Transmission Source Address]) and

(v) information relating to characteristics and functions of a protocol implemented by a station, that determines a possibility or otherwise of association with an access point, and determines a method of providing the best service to that station when association is accepted. (Gurbuz Col. 6 lines 31-53)

Regarding claim 40, Adachi in view of Gurbuz teaches wherein said access point, in response to said Association Request frame (Adachi Fig. 7 [S108]), transmits an Association Response frame (Adach Fig. 7 [S109]) request that accepts or denies a request of each station (Adachi Col. 12 lines 15-28), and comprises information elements described in following (i), (iv), and (v) and further comprises arbitrarily information elements described in (ii) and (iii) according to a network configuration, said access point and station functions, and a structure of a transmitted Association Request:

(i) a wireless network identifier for acknowledging and responding to an Association Request created by a station; (Adachi Fig. 5A [BSSID], Col. 8 lines 1-3 and 14-16 and Fig. 7 [S108])

(ii) and (iii) See section 8 above;

(iv) an address of a station itself that is an Association Response transmission destination; (Adachi Fig. 5A and Col. 8 lines 9-25) and

(v) information relating to request station (that is, success or failure) and characteristics and functions supported by an access point. (Adachi Fig. 7 and Col. 12 lines 15-28)

Regarding claim 45, Adachi in view of Gurbuz teaches said access point transmits to each station of specific beam a Poll+Supervised Contention Announcement frame (Gurbuz Col. 6 lines 26-30 "CF-End") that defines a wireless medium polling based medium access and contention based access schedule (Gurbuz Fig. 4 [CP]), said Poll+Supervised Contention Announcement frame comprising:

(i) a polling list assigned to respective stations; (Gurbuz Col. 6 lines 11-30) and

(ii) an information element that declares a medium for uplink contention based access use of a specified period known as a supervised contention access period. (Gurbuz Fig. 1 [102] and Col. 6 lines 11-43)

Regarding claim 46, Adachi in view of Gurbuz teaches said polling list comprises:

(i) an address of a station for which polling based access is permitted; (Gurbuz Col. 6 lines 11-18)

(ii) a polling time —that is, a time when a station can start transmission; (Gurbuz Col. 6 lines 11-26 *i.e.* the times are defined because they can be repeated and the

subscriber units can communicate data in response to being polled or they receive downstream data from the access point)

(iii) a polling period –that is, a period for which a station can execute transmission; (Gurbuz Col. 6 lines 11-26 *i.e.* the times are defined because they can be repeated and the subscriber units can communicate data in response to being polled or they receive downstream data from the access point) and

(iv) a purpose of polling or permission for indicating to a station that polling is for a stream that requested a band beforehand, or to request reception confirmation for a downlink frame or the like transmitted in the past. (Gurbuz Col. 6 lines 19-22)

Regarding claim 47, Adachi in view of Gurbuz teaches wherein said access point uses an SDMA compatible antenna capable of forming a sector-shaped beam (Adachi Col. 1 lines 47-54), characterized by:

(i) comparatively stable gain in a passband that minimizes fluctuation of a reception power level for a user belonging to that beam; (which is achieved by weighting signals Adachi Col. 6 lines 33-52 and Col. 7 lines 8-24) and

(ii) sharp roll-off–that is, a narrow transition width – such that a beam is generated at short intervals by an access point by suppressing occurrence of interference due to transmission from a particular beam to a user of a different beam, spectral efficiency is increased, and consequently high-throughput is obtained. (Adachi Col. 1 lines 47-54 and Gurbuz Col. 1 lines 37-49)

14. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi in view of Gurbuz as applied to claim 37 above, and further in view of LeBlanc et al. (US-5,508,707 hereinafter, LeBlanc).

Regarding claim 38, Adachi in view of Gurbuz teaches said wireless network function and protocol related information comprises:

(i) a protocol reference number that enables a station's medium access control protocol type to be confirmed; (Adachi Col. 8 lines 1-25, Fig. 5A [F1a & F1b], Gurbuz Fig. 4 [Beacon & MIMO beacon])

(ii) antenna type and pattern; (Gurbuz Fig. 4 [Beacon & MIMO beacon] and Col. 5 lines 48-53) and

(iii) antenna switching/operating functions. (Gurbuz Col. 5 line 48 through Col. 6 line 10)

Adachi in view of Gurbuz differs from the claimed invention by not explicitly reciting the information comprises station direction finding/positioning functions.

In an analogous art, LeBlanc teaches an SDMA equipped base station (Abstract) that transmits beacons containing information related to station direction finding/positioning functions. (Col. 6 lines 20-34) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement the communication system of Adachi in view of Gurbuz after modifying it to incorporate the ability to transmit location determining information in a beacon transmission of LeBlanc since it enables the location of the mobile device to be determined while quickly orientating smart antenna arrays to serve a mobile terminal. (LeBlanc Col. 12 lines 9-40)

15. Claims 39, 40 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi in view of Gurbuz and Patel et al. (US-6,865,185 hereinafter, Patel).

Regarding claim 39, Adachi teaches wherein said station, when wishing (Examiner's Note: see section 7 above) to associate with a specific wireless network transmits an Association Request frame that comprises information elements described in the following (i), (iv), and (v), and further arbitrarily comprises information elements described in (ii) and (iii) (Examiner's Note: the Examiner is assuming these points are not arbitrary) according to a network configuration and station function, and reduces signaling overhead:

(i) a wireless network identifier (Adachi Fig. 5A [BSSID]) received in a beacon frame (Adachi Col. 8 lines 1-3 and 14-16) for notifying an access point that a station wishes to associate with a WLAN; (Adachi Col. 8 lines 1-3 and 14-16 and Fig. 7 [S108])

(iv) an address of a station itself enabling unique identification by an access point in a next communication. (Adachi Col. 8 lines 14-16 and Fig. 5A [Transmission Source Address])

Adachi differs from the claimed invention by not explicitly reciting step v.

In an analogous art, Gurbuz teaches a wireless network (Fig. 1 [100]) comprising an access point (Fig. 1 [102]) equipped with a plurality of multi-beam antennas (Fig. 1 [106]) serving a plurality of stations (Fig. 1 [104]), further including:

(v) information relating to characteristics and functions of a protocol implemented by a station, that determines a possibility or otherwise of association with an access point, and determines a method of providing the best service to that station when association is accepted. (Gurbuz Col. 6 lines 31-53)

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement wireless communication system of

Adachi after modifying it to incorporate the ability to inform an access point of the type of protocol to use for communication of Gurbuz since it enables the ability to communicate with MIMO-capable devices and still have the backwards capability to communication with non-MIMO-capable devices. (Gurbuz Col. 6 lines 44-60)

Adachi in view of Gurbuz differs from the claimed invention by not explicitly reciting steps ii and iii.

In an analogous art, Patel teaches a wireless network that includes the ability to uniquely identify each packet with a sector of the wireless network and the specific beam within a sector of a wireless network. (Col. 24 lines 20-33) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement the wireless communication network of Adachi in view of Gurbuz after modifying it to incorporate the ability to distinctly identify the location of the mobile device within a cellular network for each packet transmitted of Patel. One of ordinary skill in the art would have been motivated to do this since it enables the ability to read the header information of a packet and know exactly how the base station is going to communicate the packet to the mobile device.

Regarding claim 40, Adachi in view of Gurbuz and Patel teaches wherein said access point, in response to said Association Request frame (Adachi Fig. 7 [S108]), transmits an Association Response frame (Adach Fig. 7 [S109]) request that accepts or denies a request of each station (Adachi Col. 12 lines 15-28), and comprises information elements described in following (i), (iv), and (v) and further comprises arbitrarily information elements described in (ii) and (iii) according to a network

configuration, said access point and station functions, and a structure of a transmitted Association Request:

(i) a wireless network identifier for acknowledging and responding to an Association Request created by a station; (Adachi Fig. 5A [BSSID], Col. 8 lines 1-3 and 14-16 and Fig. 7 [S108])

(ii) a group identifier of a beam group used by an access point for communication with that station; (Patel Col. 24 lines 26-27 "sector in the wireless network")

(iii) a beam identifier of a beam used by an access point for communication with that station; (Patel Col. 24 lines 28-29 "a specific beam within a sector")

(iv) an address of a station itself that is an Association Response transmission destination; (Adachi Fig. 5A and Col. 8 lines 9-25) and

(v) information relating to request station (that is, success or failure) and characteristics and functions supported by an access point. (Adachi Fig. 7 and Col. 12 lines 15-28)

Regarding claim 43, Adachi in view of Gurbuz and Patel teaches wherein said access point broadcasts to each station of a specific beam group a Beam Start Beacon frame that indicates a start of operation to users of that beam group (Gurbuz Fig. 4 and Col. 5 lines 48-53), said Beam Start Beacon frame comprising:

(i) an access point address/WLAN ID enabling identification of a transmission source for each station; (Adachi Col. 8 lines 1-13)

(ii) information relating to wireless network functions and protocol; (Adachi Col. 8 lines 1-8 and Gurbuz Col. 5 lines 48-58)

(iii) a group ID of said beam; (Patel Col. 24 lines 26-27 "sector in the wireless network")

(iv) a beam ID of said beam; (Patel Col. 24 lines 28-29 "a specific beam within a sector")

(v) a period in which said group is active –that is, a period in which an access point performs transmission/reception with users of said group before switching to a different pattern in order to handle users of another group; (Gurbuz Col. 5 lines 48-60 and Fig. 4)

(vi) a frequency for transmitting a Beam Start Beacon that makes it possible for stations of said group and beam to achieve mutual synchronization; (Gurbuz Col. 5 lines 48-50) and

(vii) a schedule of outbound transmissions created by an access point in a current group period. (Gurbuz Col. 6 lines 11-30 and Fig. 4)

16. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi in view of Karimi et al. (US-2001/0046882 hereinafter, Karimi).

Regarding claim 41, Adachi teaches the limitations of claim 33 above, but differs from the claimed invention by not explicitly reciting the limitations of claim 41.

In an analogous art, Karimi teaches in cellular radio telecommunications networks (Abstract) that utilize SDMA (Page 1 [0006]), it is common practice to assign training sequences to SDMA users (Page 1 [0003] "assign different signatures") which have a defined length (Fig. 1 i-th Train Sequence) which are used in the uplink (a transmission from user terminal to base station) in order to estimate the location of the user terminal (i.e. direction of arrival DOA). (Page 1 [0003]) At the time the invention

was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement the wireless communication system and method of Adachi after modifying it to incorporate the use of training sequences for location determining of Karimi since utilizing training sequences to have SDMA user share the same physical channel is a conventional technique in the art. (Karimi Page 1 [0003]) Further, it is well within the scope of one of ordinary skill in the art to recognize that the assigning of training sequences to users in a SDMA network is analogous to the management frame of Adachi, which is described as frames for managing a wireless system and includes the address of the destination and the source of the transmission. (Adachi Col. 8 lines 1-16)

17. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi in view of Patel.

Regarding claim 42, Adachi teaches the limitations of claim 33 above including the ability to transmit management frames that include the access point/WLAN ID (Fig. 5A [BSSID]) and the address of a station that is a transmission destination of the management frame (Fig. 5A [Destination Address]), but differs from the claimed invention by not explicitly reciting a group ID determined by an access point and assigned to a station whose address was specified and a beam identifier of a beam used by an access point in a next communication with a station whose address was specified.

In an analogous art, Patel teaches a wireless network that includes the ability to uniquely identify each packet with a sector of the wireless network (analogous to the group ID) and the specific beam within a sector of a wireless network. (Col. 24 lines 20-

33) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement the wireless communication network of Adachi after modifying it to incorporate the ability to distinctly identify the location of the mobile device within a cellular network for each packet transmitted of Patel. One of ordinary skill in the art would have been motivated to do this since it enables the ability to read the header information of a packet and know exactly how the base station is going to communicate the packet to the mobile device.

18. Claims 44 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi in view of Gurbuz, Patel and Karaoguz (US-2004/0029620).

Regarding claim 44, Adachi teaches the limitations of claim 33 above including the ability to transmit in beacon frames an access point address/WLAN ID enabling identification of a transmission source for each station (Col. 8 lines 1-16) and information relating to wireless network functions and protocol. (Col. 8 lines 1-8) Adachi differs from the claimed invention by not explicitly reciting that the access point broadcasts to each station of a specific beam group a Beam End Beacon that indicates termination of operation to users of that beam group.

In an analogous art, Gurbuz teaches a wireless network (Fig. 1 [100]) comprising an access point (Fig. 1 [102]) equipped with a plurality of multi-beam antennas (Fig. 1 [106]) serving a plurality of stations (Fig. 1 [104]) that broadcasts to each station of a specific beam group a Beam End Beacon that indicates termination of operation to users of that beam group. (Fig. 4 and Col. 5 lines 48-53) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement wireless communication system of Adachi after modifying it to incorporate

the unsupervised access mode and signaling to start/end the access periods of Gurbuz since it is advantageous to be able to maximize the spectrum by utilizing MIMO while still supporting legacy devices that operate using SISO.

Adachi in view of Gurbuz differs from the claimed invention by not explicitly reciting a group ID of the beam and a beam ID of the beam.

In an analogous art, Patel teaches a wireless network that includes the ability to uniquely identify each packet with a sector of the wireless network and the specific beam within a sector of a wireless network. (Col. 24 lines 20-33) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement the wireless communication network of Adachi in view of Gurbuz after modifying it to incorporate the ability to distinctly identify the location of the mobile device within a cellular network for each packet transmitted of Patel. One of ordinary skill in the art would have been motivated to do this since it enables the ability to read the header information of a packet and know exactly how the base station is going to communicate the packet to the mobile device.

Adachi in view of Gurbuz and Patel differs from the claimed invention by not explicitly reciting a period in which said group is inactive, and said users can adopt an operating mode that facilitates a reduction in power consumption.

In an analogous art, Karaoguz teaches a power management system in a wireless network (Abstract) that includes the ability to determine an activity time based on a number of communication beacons. (Page 4 [0038], Fig. 3, Pages 6-7 [0055-0056] and Fig. 8) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement the wireless communication system

of Adachi in view of Gurbuz and Patel after modifying it to incorporate the ability to enter a power saving mode of Karaoguz since a mobile device becomes more user friendly the longer the device can operate between battery charges. (Karaoguz Page 1 [0009-0011])

Regarding claim 49, Adachi in view of Gurbuz and Patel teaches the limitations of claim 43 above and that the downlink schedule element of said Beam Start Beacon shows an outbound transmission schedule composed of a transmission destination address (Gurbuz Col. 6 lines 19-22), transmission length (Gurbuz Fig. 4 and Col. 6 lines 19-26), and time at which said transmission is performed (Gurbuz Col. 6 lines 19-26) and shows an end of an outbound transmission schedule-that is, a transmission time corresponding to a Poll+Supervised Contention Announcement frame. (Gurbuz Col. 6 lines 19-30) Adachi in view of Gurbuz and Patel differs from the claimed invention by not explicitly reciting that a station that is not scheduled to receive an outbound transmission in a given group period to execute power-saving in a downlink period of that group period.

In an analogous art, Karaoguz teaches a power management system in a wireless network (Abstract) that includes the ability to determine an activity time based on a number of communication beacons. (Page 4 [0038], Fig. 3, Pages 6-7 [0055-0056] and Fig. 8) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement the wireless communication system of Adachi in view of Gurbuz and Patel after modifying it to incorporate the ability to enter a power saving mode of Karaoguz since a mobile device becomes more user friendly

the longer the device can operate between battery charges. (Karaoguz Page 1 [0009-0011])

19. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karimi et al. (US-2001/0046882 hereinafter, Karimi) in view of Katz (US-6,731,954).

Regarding claim 48, Karimi teaches a medium access control method in a wireless network that has stations (Page 2 [0022]) and an access point (Page 2 [0025]), said medium access control method comprising:

(i) a step of an access point transmitting an Acquisition Request frame to a station; (Page 1 [0003] "assign different signatures")

(ii) a step of a station responding to said Acquisition Request with a predetermined training sequence. (Fig. 1 i-th Train Sequence and Page 1 [0003])

Karimi teaches that the transmission of a training sequence is used in order to estimate the location of the user terminal (Page 1 [0003]), but differs from the claimed invention by not explicitly reciting the access point switching various beams that can be generated, and detecting a location of a user as being in a direction of a beam in which a training sequence is received at greatest strength and updating a user location after identifying an initial location of a station.

In an analogous art, Katz teaches a medium access control method in a wireless network that has stations (Fig. 1 [150]) and an access point (Fig. 1 [112]), said medium access control method comprising:

a station transmitting a training sequence (Col. 5 lines 28-32), where the access point switching various beams that can be generated (Fig. 3C), and detecting a location of a user as being in a direction of a beam in which a training sequence is received at

greatest strength (Col. 5 lines 36-37) and a step of updating a user location after identifying an initial location of a station. (Col. 5 lines 47-63 and Col. 6 line 59 through Col. 7 line 10)

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the telecommunications network method of Karimi after modifying it to incorporate the ability to switch the direction of the beam in order to determine the direction of the strongest training sequence of Katz. One of ordinary skill in the art would have been motivated to do this since it enables the ability to quickly determine the direction of a beam to be formed in order to communicate with the mobile device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW SAMS whose telephone number is (571)272-8099. The examiner can normally be reached on M-F 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW SAMS/
Examiner, Art Unit 2617